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FIELD CROP
ENTERPRISE BUDGET UPDATE

1990 COST AND RETURN PROJECTIONS
AND GROWER WORKSHEETS

NEW YORK STATE

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ABSTRACT

Field crop enterprise budgets emphasizing cash variable costs are constructed in the context of two whole farm businesses. The farms consist of a 200 cow dairy farm with 500 acres of field crops and a 1,200 acre crop farm with field crops only. Machinery complement and land resource assumptions are made for each farm to determine fixed costs as well as cash variable costs for machinery use on the field crops. Machinery and other costs related to livestock enterprises have not been included. The budgets permit the comparison of net returns per acre over cash variable costs for each field crop enterprise using 1990 data for operating and capital costs. Enterprise comparisons are also made for both farms with or without government program participation. The crop farm includes comparisons of results when kidney beans or oats are substituted for soybeans and for marketing half the corn crop as high moisture corn instead of dry shelled corn only.

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Introduction

The profitability of a farm business is determined by many production and management factors. Perhaps the most elusive of these factors is business management. In order to better manage and improve the profitability of a business, a manager must use many tools to assist in planning, organizing, and controlling its operations. One tool that can assist in determining business strengths and weaknesses and in planning the organization and operation of the business is enterprise analysis.

Enterprise analysis involves examining the parts which comprise the business and the interactions between them. With a farm, the parts of the business are the various crop and livestock enterprises. Enterprise analysis involves viewing each crop and livestock activity as a separate unit with their respective receipts and expenses including labor requirements and fixed costs. Thus, rather than scrutinizing only the total farm business, the emphasis is placed on examining forage, grain, livestock, and cash crop enterprises and the interactions between them. By examining receipts and all expenses for each enterprise, the strengths and weaknesses of the business can be brought into sharper focus.

Because no two farms have identical resources available, the most profitable combination of enterprises will be unique to each farm. The impact on the business of changes such as adding or deleting an enterprise is determined specifically for that farm through enterprise analysis used in conjunction with before and after whole farm analyses.

The objective of this publication is to provide a data base to assist New York farmers in analyzing field crop enterprises. Enterprise budgets for selected New York field crops are presented and discussed. These budgets are useful for cash crop and livestock farms in New York as well as other states, particularly in the Northeast. Because resources and cost structures in many areas of the Northeast are similar to New York, a budget constructed for other areas of the Northeast would be very similar to the budgets in this publication.

Purpose

The purpose of this publication is to construct 1990 budgets for field crop enterprises typically found on dairy and cash crop farms in New York State. These budgets include only the operating costs for each crop and the returns that might be expected from current prices for somewhat better than average yields.

The results of these budgets will help the user to assess current relative economic advantages of the crops considered. With this information, researchers and farm managers will have a base of information that will help them to advise and make better informed decisions about profitable combinations of crop enterprises. The results can be used as presented or as adapted to meet the conditions of a specific farm business in the budgeting process.

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The Budget Procedure

The crop enterprise budgets in this publication are constructed using the economic-engineering approach. This procedure uses current prices for operating costs such as seed, fertilizer, chemicals, and supplies. Other variable costs such as machinery repairs and fuel are calculated using engineering data for the operation of the machinery complements assumed for the farm operation.

Although all costs of production need to be considered to determine enterprise profits, these budgets are designed to aid in making short-run, annual decisions about enterprise size and mix. With relatively stable fixed costs to spread over the crop acreage, the variable costs, considered here, will provide an estimate of the annual operating costs for each crop. These costs and assumed crop values are used to estimate the net contribution each crop will make toward meeting the fixed costs and other obligations of the farm operator.

The budgets are developed within the context of either a dairy farm or a crop farm. Dairy farms of various sizes are common throughout New York State. The central and western New York counties are the most likely locations for crop farms and the larger dairy farms. Budget results should be interpreted and applied in the light of the assumptions made. They can be used for specific farm situations if differences related to enterprise size and yield, and machinery complements are recognized.

Crops common to a dairy farm are budgeted for a 500 acre, 200 cow dairy farm. The crop mix includes 250 acres of hay crops harvested as 100 acres of dry hay and 150 acres of hay crop silage. Two hundred fifty acres of corn are harvested as 150 acres of corn silage and 100 acres of high moisture ear corn. Budgets are prepared for the dairy farm crops with and without participation in the 1990 feed grain program.

A 1,200 acre cash crop farm is used as the framework to develop budgets for various field crops common to New York State. Two approaches are budgeted - without and with participation in the 1990 ASCS feed grain program. The basic crop mix for this farm includes 100 acres of dry hay, 750 acres of corn grain, 200 acres of a row crop, and 150 acres of a small grain crop.

Each of these two types of farms has a field machinery complement typical of what might be expected to grow and harvest the crops grown on that farm. Tractors and equipment used for livestock care are not included in the machinery complement. Engineering data for each piece of machinery are used to calculate operating and ownership costs for use in the budgets.

The budgets are developed for a given yield level and enterprise size for each crop enterprise. Annual operating costs are included to grow and harvest the crop. Harvest costs for the feed crops on the dairy farm include costs associated with placing the crop in farm storage. Harvest costs for the cash crop enterprises include costs necessary to prepare the crop for sale at the farm gate at harvest time. Costs to store the crops are not included for either farm.

Returns for each crop are based on estimates of values at harvest time and somewhat better than average yields. Cultural practices and input costs are reflective of good yield expectations. Hay crop yields on the dairy farm were assumed to average three tons of dry hay whether harvested dry or as silage. Yield for the acre equivalents of hay crop silage was expressed in terms of hay equivalent to relate production to the value of more readily marketable hay. High moisture corn yields are consistent with the nitrogen input level for corn

grain and the tendency for dairy farmers to harvest the more mature corn as grain rather than silage. Yields for the crop farms are also reflective of the input levels used and good cultural practices.

The budgeting procedure has involved the use of a computer spreadsheet program in the form of templates developed primarily to calculate operating costs for tractors and equipment used to produce the crops. Machinery related assumptions such as price, life, amount of annual use, and other factors will have an effect on operating costs charged to the crops. The assumptions used in the templates are indicative of the experience of New York crop producers and are presented in the Appendix of this publication.

Sources of Data

Many sources of data have been used in the construction of the budgets. Cultural practices and input levels were assumed with reference to Cornell Recommends for Field Crops. These practices were adapted to the budgets with the help of members of the Department of Agronomy at Cornell. Several commercial sources provided current prices on crop inputs and farm machinery (Snyder). Engineering formulas and data used to calculate machinery costs were obtained from agricultural engineering sources (Lazarus). Contact with farm operators enhanced the judgment of the author in compiling reasonable machinery complements and enterprise combinations.

Suggestions for Use

The field crop budgets presented in this publication have several applications. One obvious use is to provide an estimate of current operating costs for a variety of field crops commonly grown in the State. The results can be used to determine relative direct costs to grow and harvest the budgeted crops. For both farms, results of not participating in the 1990 feed grain program can be compared with participation on the same farm.

The budgets can also be used to plan annual crop acreage combinations. As a starting point, they can be adapted to an individual set of practices and prices to provide estimates of cash flow needs and potential profits for a new year.

Finally, the budgeting process can help explore implications for major changes in enterprise size. Most variable costs included in the budgets will not change significantly with changes in enterprise size. However, as changes in enterprise size or practices dictate changes in equipment size and mix, operating costs per acre for repairs and fuel are likely to change to some degree.

Care must be exercised in using the enterprise budgets for they are only one estimate of costs and returns. They are not designed to represent average New York State conditions; instead they represent a specific set of conditions specified in the footnotes and accompanying tables. It is difficult for a user to compare his or her situation with an "average" so that necessary adjustments can be made. With a specified set of conditions, the user has a basis for comparison. The user should compare his or her conditions with those assumed in the budgets. Whenever the farm situation differs significantly from the assumed conditions, the budgeted values must be critically analyzed and often changed. Budget worksheets are provided later in this publication for application of these procedures to a specific farm situation.

Product Prices and Input Costs

The prices and costs used in the budgets are shown in Table 1. The product prices are expectations for the 1990 crop year in New York State (Snyder, 1990). Feed grain prices are estimated local support prices at harvest at the farm. Deficiency payments for corn and wheat are used to estimate the effect of program participation for these crops. The user should include the effects of participation on enterprise costs and returns and on the whole farm business as decisions are made about a cropping program.

Input costs are representative of what producers can expect to pay for seed, fertilizer, chemicals, supplies, and other costs in 1990 (Snyder).

Budget Format

Because these budgets are intended to aid in making short-run management decisions, the format includes provision for only variable costs for each crop. Budgets are presented for the dairy farm and several situations on the crop farm.

The dairy farm (Tables 2 through 5) and cash crop farm include the crop enterprise mixes described earlier. A comparison is made between participation and non-participation in the feed grain program on the dairy farm.

Two crop farm situations are budgeted for different corn planting methods. Crop Farm #1 (the base farm) is budgeted for corn grain grown using conventional tillage practices (Tables 6 and 7). Crop Farm #2 has the same crop mix and acreages but the budgets are adapted for corn grain grown using no-till related practices, machinery, and inputs (Tables 10 and 11). Other management practices are assumed to be the same for both crop farms.

Budgets for other situations are presented for Crop Farm #1. Budgets are presented for red kidney beans and oats substituted for soybeans with no equipment or acreage changes (Tables 6 and 7). Also, enterprise budgets are presented for the base crops on Crop Farm #1 assuming participation in the corn and wheat feed grain programs with acreages at or slightly less than the maximum permitted acreages for each crop (Tables 8 and 9).

Variable costs are divided into four categories: cash costs for growing and harvesting the crop, interest on these operating costs, and labor costs. Labor is included as a variable cost because of the varying requirements for the different crops.

The first table for each farm situation (Tables 2, 4, 6, 8, 10, and 12) provides some detail for the various categories as well as the total of these variable costs. Numbers in parentheses indicate physical quantities of those inputs.

The second table for each situation (Tables 3, 5, 7, 9, 11, and 13) compares the variable costs and returns for each crop. The tables also illustrate the effects of crop price or yield changes on returns per unit for each enterprise.

Table 1. Projected Product Prices and Input Costs
New York State, 1990

PRICES

Product	Unit	Projected Harvest Prices at the Farm
Hay-alfalfa & grass	ton	$74.00
Corn silage	ton	23.00
Corn grain	bushel	2.45
Corn deficiency payment	bushel	0.864
HM ear corn (33% mc)	ton	60.00
Wheat	bushel	3.70
Wheat deficiency payment	bushel	0.864
Oats	bushel	1.50
Straw, wheat	ton	70.00
Straw, oat	ton	60.00
Soybeans	bushel	5.75
Red kidney beans	pound	0.22

COSTS[a]

Item	Unit	Cost	Item	Unit	Cost
Seed			Chemicals[b]		
Alfalfa	pound	$ 2.91	2, 4-D	gallon	$11.86
Timothy	pound	0.80	2, 4-DB	gallon	27.19
Corn	unit	71.14	Atrazine 4L	gallon	11.12
Oats	bushel	6.07	Benlate 50WP	pound	15.45
Wheat, winter	bushel	7.75	Dual 8E	gallon	56.70
Soybeans	bushel	15.25	Eptam 7E	gallon	22.96
Red kidney beans	pound	0.75	Furadan 15G	pound	1.45
			Lasso	gallon	22.90
Fertilizer			Lorox L	gallon	61.21
N	pound	0.22	Gramoxone Super	gallon	37.32
P	pound	0.20	Thimet 20G	pound	1.45
K	pound	0.12	Treflan	gallon	28.96
			Malathion 5E	gallon	20.12
Lime,			Methoxychlor 2E	gallon	15.00
spread (91% ENV)	ton	25.69	Seed treatment	acre	0.95
Labor Cost			Other		
Regular	hour	7.50	Twine (9,000 feet)	bale	22.48
Hourly, seasonal	hour	5.50	Diesel-field	gallon	0.90
			Diesel-road	gallon	1.20
Capital	percent	11.5	Gasoline-field, UL	gallon	0.80
			Gasoline-road, UL	gallon	1.00
			LP gas-propane	gallon	0.75

[a]Snyder, 1990.
[b]Trade names are used as examples and do not imply endorsement.

In analyzing the short-run income and profitability of each crop, the net returns per acre and per unit over variable costs provides a basis for comparison. This factor shows how much each crop acre or unit contributes to fixed or overhead costs for each enterprise. Fixed costs include the ownership costs (depreciation, interest, taxes, insurance, and housing) for the machinery complement and land resource. The factor does not include a contribution toward the costs of marketing the crop since the assumption has been made that the crop is priced at harvest.

An analysis that included the marketing activity would involve assumptions related to the average crop price received during the marketing period and the costs associated with the marketing effort. These costs would include storage, interest on the stored crop, processing, packaging, transportation, and any other items that had an effect on the price received for the crop. Marketing practices vary widely between farms and are best analyzed apart from production practices and on a farm specific basis.

Tables 2 through 13 show budgeted variable costs for typical crops in the various farm situations. The next three tables (Tables 14, 15, and 16) provide comparisons of total costs and returns for the farms in each situation. These tables include the fixed costs for machine ownership and a charge for the use of the land. Land is charged at a rental rate of $35 per acre. At $35 per acre, actual costs of ownership are understated. However, a common rental rate applied consistently to each enterprise and farm situation prevents differences in taxes and land values from affecting enterprise result comparisons.

Tables 14, 15, and 16 show the total value of all crops grown in each combination of field crop enterprises. The reader is reminded that these values represent harvest time values and the budget costs do not include storing or marketing costs. To be successful, marketing efforts should result in crop prices enough higher than harvest time values to more than offset storing and marketing costs.

Total variable costs for the farm situations shown in the tables will provide some indication of the cash flow needs to grow and harvest the crops. These needs can be compared for the various crop enterprise combinations shown.

Budget Results

The purpose of the following tables is to provide data to enable the reader to examine the relative costs and returns from the crop mix situations presented. These crop mix decisions are shown in the context of two farm units considered reasonable in size for central and western New York State. These units are a 200 cow dairy farm with 500 acres of field crops and a crop farm with 1,200 acres of field crops. The budgets assume a continuing business with the same land base and field equipment resource except for equipment adjustments made to grow alternative crops including red kidney beans and no-till corn. Because labor requirements vary by crop, labor has been included as a variable cost.

The data for each crop mix are presented in pairs of tables. The first table details the variable costs for each crop and provides a projected total variable cost per acre. The second table presents projected returns per acre and shows the net returns over variable costs per acre.

Since the acre is the unit of production common to each crop, net returns per acre over variable costs is a good factor to use in comparing one crop with another. This factor indicates how much each crop contributes toward meeting

the fixed costs of the business such as land and equipment ownership costs. A comparison of this factor for each crop should influence which crops and how many acres of each should be grown based on the assumptions used in the budgets.

Also, shown in the second table is the break-even price per unit of primary crop necessary to cover the variable costs for the yield assumed. Finally, results are shown for situations where crop prices or yields are 20 percent lower and higher than those assumed.

Enterprise Results

Dairy Farm - Table 2 shows that the total variable costs per acre for hay and hay crop silage were quite similar. Variable costs for the corn crops were also very similar in spite of some input differences. Less nitrogen was used on corn silage than on high moisture corn because of manure application on corn silage planted closer to the farmstead. This lower cost for corn silage was somewhat offset by higher labor and harvesting equipment costs. Overall, total variable costs per acre for the corn crops were higher than for the hay crops. In Table 3, with the yields and crop values assumed for these budgets, net returns per acre over variable costs for the hay crops were quite similar. Corn silage, valued at about 30 percent of the price of hay as harvested, had a considerably higher net return per acre than the hay crops or high moisture corn.

Tables 4 and 5 are intended to show the effects of participating in the feed grain program on the dairy farm. Only the high moisture corn enterprise is affected significantly. Since 150 acres of corn silage are needed for the dairy herd, the program requirement to set aside at least 10 percent of the corn base reduced the high moisture corn acreage from 100 to 75 acres. Costs and returns for the 75 planted acres are shown per base acre in the enterprise for comparison purposes. Participation results in significantly higher net returns per acre of high moisture corn.

Crop Farm #1 - Variable costs per acre for the field crops grown on the crop farm, along with two substitute crops, are shown in Table 6. In the case of Crop Farm #1, the corn grain was grown using conventional tillage practices. Total variable costs per acre for corn were highest at $203 with red kidney beans next at $179 per acre. Variable costs for the other crops ranged from $114 to $134 per acre. Table 7 illustrates the advantage, in 1990, of red kidney beans over soybeans under the assumptions used. Red kidney beans are projected to contribute about $7 per acre more than soybeans toward the fixed costs and other financial needs of the business. Oats had the lowest net return per acre of the three alternative crops.

In Tables 8 and 9, the effects of participation in the corn and wheat feed grain programs are compared with the effects of nonparticipation. Enterprise size for both situations is held constant; that is, set-aside acres are included with producing acres. By including set-aside acres, costs and returns per acre for the participating enterprise were proportionately less than for the nonparticipating enterprise. The combination of lower costs and government payments for participating in the feed grain programs resulted in higher net returns and illustrate the advantage participating growers have over nonparticipating growers for each enterprise.

Table 9 shows that net returns per acre over variable costs were $61 higher for the 750 acre corn enterprise and $28 higher for the 150 acre wheat enterprise due to participation in the feed grain program. Since fixed costs would change very little, as indicated in the Table 14 comparison, participation would add about $42 per acre or nearly $51,000 to the return to management and

profit for the year. As always, these results are based on the assumptions used but do illustrate the importance of time and effort used to develop good data on which to base management decisions.

Crop Farm #2 - The results of conventional tillage and no-till practices for corn can be compared from Tables 6 and 7, and Tables 10 and 11. Tables 10 and 11 show results for Crop Farm #2 which has essentially the same resources and crop mix as the basic Crop Farm #1. However, the corn crop on Crop Farm #2 is grown using no-till practices. Also, appropriate adjustments have been made in equipment needed for the change in tillage method.

According to these budgets, total variable costs for both corn production practices are quite similar. Higher seed, lime, and drying costs for no-till corn are essentially offset by lower equipment and labor costs. Because the no-till corn yield was five bushels per acre lower than for conventionally tilled corn, total returns per acre were lower and net returns per acre were about $14 less for no-till corn.

General - From a comparison of enterprise results presented in Tables 2 through 13, one can see the differences in variable costs and returns for the various crops as projected for the 1990 season. From this comparison, management decisions can be made to determine the most profitable combination of crop enterprises as well as marketing alternatives, particularly for the crop farm.

The dairy farm enterprises (Tables 2 through 5) provide data for high moisture corn which can be a marketing alternative for corn grown on the crop farm. At similar dry shell equivalent yields, high moisture ear corn would result in somewhat higher returns per acre and, eliminating drying costs, would reduce production costs. Thus, with extra marketing efforts to develop high moisture corn markets, a substantial increase in net returns could be realized for corn harvested as high moisture corn instead of dry shelled corn. A comparison of net returns per acre over variable costs in Tables 3 and 7 shows an advantage of over $65 per acre for high moisture corn over dry shelled corn. Similarly, Table 13 shows a $31 per acre higher net return when half of the corn crop is sold as high moisture corn on Crop Farm #1.

As indicated earlier, participation in the government farm programs boosts corn and wheat net returns per acre over variable costs (Table 9). Likewise, red kidney beans resulted in higher net returns per acre than either soybeans or oats (Table 7). In Tables 12 and 13, costs and returns are listed for the four basic crops for Crop Farm #1 assuming government program participation. Also, data are listed for the corn enterprise assuming half the crop is harvested and sold as high moisture ear corn. Data for red kidney beans are listed as an alternative crop to soybeans. From these data, one can compare the net returns per acre over variable costs in making the decision about choosing the optimum combination of enterprises.

Whole Farm Results

Differences in net returns per acre for individual enterprises are reflected in the results for the overall farm businesses of which the enterprises are a part. Tables 14 to 16 indicate levels of net returns over variable costs for each farm situation for the crop costs detailed in previous tables. This factor provides an indication of the amount available from the current year's crop proceeds to meet fixed costs, principal payments on debt, capital purchases, and management expectations of the farm operator. The farm operator's labor cost is included with other labor.

Net returns over total costs for each farm situation in the tables provides a comparison of returns to management and profit for the operator of the farm business. The dairy farm has income from livestock, not shown in the tables, in addition to the value of crops fed on the farm. Therefore, it is not easily compared with the cash crop farm situations. Table 14 indicates a positive contribution to farm profit from the crop enterprises on the dairy farm using the assumed crop values, yields, and costs. Results of the dairy enterprise would affect the net returns for the dairy farm as a whole.

Overall farm results for the crop farm vary widely for the various situations budgeted. The slight advantage of conventional tillage for corn shown in the enterprise data is reflected in Table 14 as whole farm results are compared. Net returns over total costs increase from $8,276 with no-till corn to $10,962 with conventional tillage. Conventionally tilled corn with participation in the government farm programs adds nearly $51,000 more to the projected net returns for Crop Farm #1.

In Table 15, whole farm results are shown for the crop farm when either soybeans, red kidney beans or oats are grown. Again, red kidney beans show a slight advantage over oats and even more of an advantage over soybeans.

Combinations of marketing practices and crop mixes showing the greatest profit potential are compared in Table 16. By comparing alternative practices and crops with a base situation in a whole farm context, management decisions can be made to determine combinations most likely to enhance net returns. With the assumptions used in these budgets, government program participation for corn and wheat, conventional tillage for corn, marketing high moisture corn and substituting red kidney beans for soybeans result in the highest net return for the crop farm.

Reference is made to Appendix Tables 1 through 4 which show data for the crop machinery complements used for the dairy farm and each of the two crop farm budgets.

Notes to the following Tables 2, 4, 6, 8, 10, and 12:

Crop inputs and practices are assumed to be reasonable for above average yields on well managed farms with good soil resources.

a. Seed - Hay crops: Cost represents the annual cost for 12 pounds of alfalfa and five pounds of timothy allocated over a four year life for the crop.

Corn: 25-28 thousand kernels per acre.

b. Fertilizer - Hay crops - Includes 25 percent of fertilizer required for seeding plus an annual top dressing.

Corn silage - Nitrogen reduced because of manure application.

c. Lime - Application should be based on soil test results. One-half ton of lime per acre is assumed for annual pH maintenance except for a somewhat higher requirement for no-till corn to maintain pH in the seed zone.

d. Chemicals - materials applied at recommended rates.

Hay crops - Methoxychlor and Malathion applied annually to 15 percent of the acreage.

Corn - Conventional tillage - Dual and Atrazine, Furadan on 1/2 acreage, seed treatment.

Corn - No till - Gramoxone Super on 25 percent of acres, Dual, Atrazine, Furadan on 1/2 acreage, seed treatment.

Soybeans - Dual, Lorox; seed treatment.

Red Kidney Beans - Eptam, Treflan; seed treatment.

Winter Wheat and Oats - 2,4-D.

e. Interest - Calculated on growing and harvesting expenses at 11.5 percent for the crop production period.

f. Labor - Hours based on 1.3 times machinery hours. Additional hours added for handling hay and straw.

g. Drying Corn - Assume removal of 10 percentage points of moisture at 3.15 cents per point per bushel or 31.5 cents per bushel for all drying related costs. No-till corn is dried 11.5 points for 36.2 cents per bushel.

h. Red Kidney Beans - Assume removal of 3 percentage points of moisture from 15 percent of the crop at 6.3 cents per point per bushel (twice the cost of drying corn due to longer time at lower temperatures to maintain quality).

Notes to Tables 4 and 5, 8 and 9, and 12 and 13:

a. Costs and returns for corn and wheat enterprises participating in government programs are averaged over the total enterprise acreage including set-aside acreage.

b. Other returns per acre:

Straw - Wheat - 1 ton per acre x $70 per ton = $70 per acre
Oats - 1 ton per acre x $60 per ton = $60 per acre

Government program receipts - Corn and Wheat
Deficiency payments = $0.864 net per bushel for corn and wheat
Minimum set aside required:
Corn = 10 percent of base acres; Wheat = five percent of base acres
ASCS yields: Corn = 90 bushels per acre, Wheat = 45 bushels per acre

Dairy farm - corn base = 250 acres
Permitted acres: 250 acres x 90 percent = 225 acres permitted to plant
Planted acres: 150 acres for corn silage with no set aside
75 acres for high moisture corn (HMC) with
25 acres for set aside
Total deficiency payment:
225 acres planted x 90 bushels per acre x $0.864 per bushel = $17,496

HMC enterprise: (100 acre base; 75 acres planted)
Total other returns = $17,496 ÷ 100 acres = $174.96 per base acre
$17,496 ÷ 75 acres = $233.28 per planted acre

Crop farm - corn base = 750 acres; wheat base = 150 acres
Permitted acres:
Corn - 750 acres x 90 percent = 675 acres permitted to plant
Wheat - 150 acres x 95 percent = 142.5 acres permitted to plant
Planted acres: Corn = 675 acres; wheat = 142 acres.

Corn:
Total other returns -
Deficiency payments: 675 acres x 90 bushels per acre x $0.864 per bushel = $52,488[1]
Per base acre = $69.98 per acre
Per planted acre = $77.76 per acre

Wheat:
Total other returns -

Deficiency payments:	142 acres x 45 bushels per acre x $0.864 per bushel =	$ 5,521[1]
Straw:	142 acres x 1 ton per acre x $70 per ton =	9,940
Total other returns for wheat		$15,461

Per base acre = $103.07 per acre
Per planted acre = $108.88 per acre

[1]Assumes two business partners: agricultural program receipts may not exceed $50,000 per person.

Table 2. Field Crop Enterprise Budgets
Variable Costs per Acre
500 acre, 200 Cow Dairy Farm - 1990 Projected

Crop	Hay		Hay Crop Silage- HE*		Corn Silage**		High Moisture Ear Corn	
Acres	100		150		150		100	
Yield/ac, tn	3.0		3.0		17.0		5.3	
	qty	$	qty	$	qty	$	qty	$
Variable Growing Costs -								
Seed		9.73		9.73	28K	24.90	25.6K	22.76
Fert-N (lb)	0	0.00	0	0.00	60	13.20	140	30.80
P (lb)	35	7.00	35	7.00	40	8.00	40	8.00
K (lb)	57	6.84	57	6.84	40	4.80	40	4.80
Lime	0.5	12.85	0.5	12.85	0.5	12.85	0.5	12.85
Chemicals		2.66		2.66		22.77		22.77
Power/Eqpt-								
Fuel, oil		2.36		2.36		6.58		6.58
Repair		2.51		2.51		7.04		7.04
Other		2.00		2.00		2.00		2.00
Total Grow		45.95		45.95		102.14		117.60
Variable Harvesting Costs -								
Power/Eqpt-								
Fuel, oil		8.57		12.92		9.03		7.06
Repair		12.90		19.70		9.78		7.64
Twine		7.49		0.00		0.00		0.00
Other		3.00		3.00		5.00		5.00
Total Harvest		31.96		35.62		23.81		19.70
Int - operating		4.48		4.69		4.83		5.26
Total Selected Var. Costs		82.39		86.26		130.78		142.56
Labor (hr)	6.9	46.41	5.0	36.63	5.3	37.41	3.3	25.07
Total Var Costs		128.80		122.89		168.19		167.63

See notes on page 10.

* HE = hay equivalent yield
** Nitrogen applied to corn silage is less than the amount applied to high moisture ear corn because of manure applied to corn that tends to be planted on fields closest to the farmstead.

Table 3. Field Crop Enterprise Budgets
Comparison of Returns Over Variable Costs
500 acre, 200 cow Dairy Farm - 1990 Projected

Crop	Hay	Hay Crop Silage- HE*	Corn Silage	High Moist Ear Corn
Acres	100	150	150	100
Yield / ac, tn	3.0	3.0	17.0	5.3
Price / Unit, $	74.00	74.00	23.00	60.00
	$	$	$	$
Returns per Acre -				
Crop	222.00	222.00	391.00	318.00
Other	0.00	0.00	0.00	0.00
Total returns	222.00	222.00	391.00	318.00
Total Variable Costs - per acre	128.80	122.89	168.19	167.63
Net Returns over Variable Costs				
- per acre	93.20	99.11	222.81	150.37
- per unit	31.07	33.04	13.11	28.37
Break-even price per unit of primary crop to cover variable costs	42.93	40.96	9.89	31.63
SENSITIVITY TO CROP PRICE OR YIELD CHANGES:				
20% Lower Crop Price or Yield				
Tot return/ ac	177.60	177.60	312.80	254.40
Net returns over var costs:				
- per acre	48.80	54.71	144.61	86.77
- per unit	16.27	18.24	8.51	16.37
20% Higher Crop Price or Yield				
Tot return/ ac	266.40	266.40	469.20	381.60
Net returns over var costs:				
- per acre	137.60	143.51	301.01	213.97
- per unit	45.87	47.84	17.71	40.37

* HE = hay equivalent yield

Table 4.

Field Crop Enterprise Budgets
Variable Costs per Acre
500 acre, 200 Cow Dairy Farm - 1990 Projected
(Government program participation and non-participation compared)

Crop	Hay		Hay Crop Silage- HE		Corn Silage		High Moisture Ear Corn Participate*		Non-part**	
Acres	100		150		150		75/25		100	
Yield/acre, tn	3.0		3.0		17.0		4.0		5.3	
	Qty	$	Qty	$	Qty	$	Qty	$	Qty	$
Variable Growing Costs -							per base ac			
Seed		9.73		9.73	28K	24.90	19.2K	17.07	25.6K	22.76
Fert-N (lb)	0	0.00	0	0.00	60	13.20	105	23.10	140	30.80
P (lb)	35	7.00	35	7.00	40	8.00	30	6.00	40	8.00
K (lb)	57	6.84	57	6.84	40	4.80	30	3.60	40	4.80
Lime	0.5	12.85	0.5	12.85	0.5	12.85	0.38	9.64	0.5	12.85
Chemicals		2.66		2.66		22.77		17.08		22.77
Power/Eqpt-										
Fuel, oil		2.39		2.39		6.61		4.96		6.58
Repair		2.52		2.52		6.91		5.18		7.04
Other		2.00		2.00		2.00		3.00		2.00
Total Grow		45.99		45.99		102.04		89.63		117.60
Variable Harvesting Costs -										
Power/Eqpt-										
Fuel, oil		8.60		12.95		9.06		5.32		7.06
Repair		12.90		19.52		9.72		5.52		7.64
Twine		7.49		0.00		0.00		0.00		0.00
Other		3.00		3.00		5.00		3.75		5.00
Total Harvest		31.99		35.47		23.78		14.59		19.70
Int - operating		4.48		4.68		4.82		4.00		5.26
Total Selected Var. Costs		82.46		86.14		130.64		108.22		142.56
Labor (hr)	6.9	46.61	5.0	36.84	5.3	37.62	2.6	18.95	3.3	25.07
Total Var Costs		129.07		122.98		168.26		127.17		167.63

See notes on page 10.

* Total corn base is 250 acres. The dairy herd requires 150 acres of corn silage. The balance of the corn base (100 acres) is allocated to high moisture ear corn. To participate in the feed grain program, a grower is required to idle at least 10 percent of his base acres. Thus, 75 acres of high moisture corn are planted and 10 percent (25 acres) of the total base is used for set aside. Variable costs per acre for moisture corn are shown per base acre (100 acres) or 75 percent of the cost per planted acre. Corn yields are also per base acre. "Other" growing costs for participating crops include costs for one custom mowing for weed control on set aside acres.

** Costs for the non-participating corn enterprise are taken from Table 2.

Table 5. Field Crop Enterprise Budgets
Comparison of Returns Over Variable Costs
500 acre, 200 cow Dairy Farm - 1990 Projected
(Government program participation and non-participation compared)

Crop	Hay	Hay Crop Silage- HE*	Corn Silage	High Moisture Ear Corn Participate	High Moisture Ear Corn Non-Part**
Acres	100	150	150	75/25	100
Yield/acre, tn	3.0	3.0	17.0	4.0	5.3
Price / Unit, $	74.00	74.00	23.00	60.00	60.00
	$	$	$	$	$
Returns per Acre -				per base ac	
Crop	222.00	222.00	391.00	238.50	318.00
Other	0.00	0.00	0.00	174.96	0.00
Total Returns	222.00	222.00	391.00	413.46	318.00
Total Variable Costs - per acre	129.07	122.98	168.26	127.17	167.63
Net Returns over Variable Costs					
- per acre	92.93	99.02	222.74	286.29	150.37
- per unit	30.98	33.01	13.10	72.02	28.37
Break-even price per unit of primary crop to cover variable costs	43.02	40.99	9.90	(12.02)	31.63
SENSITIVITY TO CROP PRICE OR YIELD CHANGES:					
20% Lower Crop Price or Yield					
Total returns/ acre	177.60	177.60	312.80	330.77	254.40
Net returns over variable costs					
- per acre	48.53	54.62	144.54	203.60	86.77
- per unit	16.18	18.21	8.50	51.22	16.37
20% Higher Crop Price or Yield					
Total returns/ acre	266.40	266.40	469.20	496.15	381.60
Net returns over variable costs					
- per acre	137.33	143.42	300.94	368.98	213.97
- per unit	45.78	47.81	17.70	92.83	40.37

See notes on page 11.

* HE = hay equivalent yield

** From Table 3.

Table 6. Field Crop Enterprise Budgets
Variable Costs per Acre
1,200 acre, Crop Farm #1 - 1990 Projected
(No participation in government programs)

Crop	Hay		Corn Grain (conv-till)		Soybeans (drilled)		Winter Wheat		Substituted for Soybeans RK Beans		Oats	
Acres	100		750		200		150		200		200	
Yield / acre	3 tn		120 bu		35 bu		60 bu		1200 lb		80 bu	
	Qty	$	Qty	$	Qty	$	Qty	$	Qty	$	Qty	$
Variable Growing Costs -												
Seed (kernels/lbs)		9.73	25.6K	22.76	60	15.25	120	15.50	84	63.00	80	15.18
Fert-N (lb)	0	0.00	140	30.80	10	2.20	50	11.00	25	5.50	50	11.00
P (lb)	35	7.00	40	8.00	20	4.00	40	8.00	62	12.40	30	6.00
K (lb)	57	6.84	40	4.80	20	2.40	20	2.40	43	5.16	20	2.40
Lime (tn)	0.5	12.85	0.5	12.85	0.5	12.85	0.5	12.85	0.5	12.85	0.5	12.85
Chemicals		2.66		22.77		30.43		1.11		19.49		1.11
Power/Eqpt-												
Fuel, oil		2.00		5.47		5.35		5.35		5.72		5.35
Repair		2.68		7.52		6.73		6.73		8.07		6.74
Other		2.00		2.00		3.00		1.00		3.00		2.00
Total Grow		45.76		116.97		82.21		63.94		135.19		62.63
Variable Harvesting Costs -												
Power/Eqpt-												
Fuel, oil		9.15		4.58		3.02		4.84		2.93		4.87
Repair		13.54		11.78		10.42		9.84		10.35		10.38
Drying		0.00		37.80		0.00		0.00		0.57		0.00
Twine		7.49		0.00		0.00		2.50		0.00		2.50
Other		3.00		5.00		5.00		3.00		5.00		3.00
Total Harvest		33.18		59.16		18.44		20.18		18.85		20.85
Interest - operating		4.54		6.75		3.86		7.25		5.90		3.20
Total Selected Variable Costs		83.48		182.88		104.51		91.37		159.94		86.68
Labor (hr)	7.4	50.62	2.7	20.30	2.5	18.77	4.1	29.47	2.5	19.09	3.6	27.03
Total Variable Costs		134.10		203.18		123.28		120.84		179.03		113.71

See notes on page 10.

Table 7. Field Crop Enterprise Budgets
Comparison of Returns Over Variable Costs
1,200 acre, Crop Farm #1 - 1990 Projected
(No participation in government programs)

Crop	Hay	Corn Grain (conv-till)	Soybeans (drilled)	Winter Wheat	Substituted for Soybeans RK Beans	Substituted for Soybeans Oats
Acres	100	750	200	150	200	200
Yield / acre	3 tn	120 bu	35 bu	60 bu	1,200 lb	80 bu
Price / Unit, $	74.00	2.40	5.75	3.70	0.22	1.50
	$	$	$	$	$	$
Returns per Acre -						
Crop	222.00	288.00	201.25	222.00	264.00	120.00
Other	0.00	0.00	0.00	70.00	0.00	60.00
Total returns	222.00	288.00	201.25	292.00	264.00	180.00
Total Variable Costs - per acre	134.10	203.18	123.28	120.84	179.03	113.71
Net Returns over Variable Costs						
- per acre	87.90	84.82	77.97	171.16	84.97	66.29
- per unit	29.30	0.71	2.23	2.85	0.07	0.83
Break-even price per unit of primary crop to cover variable costs	44.70	1.69	3.52	0.85	0.15	0.67
SENSITIVITY TO CROP PRICE OR YIELD CHANGES:						
20% Lower Crop Price or Yield						
Total return/ acre	177.60	230.40	161.00	233.60	211.20	144.00
Net returns over variable costs						
- per acre	43.50	27.22	37.72	112.76	32.17	30.29
- per unit	14.50	0.23	1.08	1.88	0.03	0.38
20% Higher Crop Price or Yield						
Total return/ acre	266.40	345.60	241.50	350.40	316.80	216.00
Net returns over variable costs						
- per acre	132.30	142.42	118.22	229.56	137.77	102.29
- per unit	44.10	1.19	3.38	3.83	0.11	1.28

Table 8.

Field Crop Enterprise Budgets
Variable Costs per Acre
1,200 acre Crop Farm #1 - 1990 Projected
(Government program participation and non-participation compared)

Crop	Hay		Corn grain				Soybeans		Winter wheat			
			Participate*		Non-part**		(drilled)		Participate*		Non-part**	
Acres: planted/set aside	100		675/75		750		200		142/8		150	
Yield / acre	3 tn		108 bu		120 bu		35 bu		57 bu		60 bu	
	Qty	$	Qty	$	Qty	$	Qty	$	Qty	$	Qty	$
Variable Growing Costs -			per base ac						per base ac			
Seed		9.73	23K	20.48	25.6K	22.76	60	15.25	114	14.73	120	15.50
Fert-N (lb)	0	0.00	126	27.72	140	30.80	10	2.20	48	10.45	50	11.00
P (lb)	35	7.00	36	7.20	40	8.00	20	4.00	38	7.60	40	8.00
K (lb)	57	6.84	36	4.32	40	4.80	20	2.40	19	2.28	20	2.40
Lime (tn)	0.5	12.85	0.45	11.57	0.5	12.85	0.5	12.85	0.48	12.21	0.5	12.85
Chemicals		2.66		20.49		22.77		30.43		1.05		1.11
Power/Eqpt-												
Fuel, oil		2.02		4.93		5.47		5.37		5.10		5.35
Repair		2.65		6.59		7.52		6.60		6.27		6.73
Other		2.00		2.40		2.00		3.00		1.27		1.00
Total Growing Costs		45.75		105.70		116.97		82.10		60.96		63.94
Variable Harvesting Costs -												
Power/Eqpt-												
Fuel, oil		9.16		4.23		4.58		3.11		4.66		4.84
Repair		13.42		10.39		11.78		10.22		9.20		9.84
Drying		0.00		34.02		37.80		0.00		0.00		0.00
Twine		7.49		0.00		0.00		0.00		2.38		2.50
Other		3.00		4.50		5.00		5.00		2.85		3.00
Total Harvesting Costs		33.07		53.14		59.16		18.33		19.09		20.18
Interest - operating		4.53		6.09		6.75		3.85		6.91		7.25
Total Selected Variable Costs		83.35		164.93		182.88		104.28		86.96		91.37
Labor (hr)	7.4	50.74	2.5	18.59	2.7	20.30	2.5	19.08	3.9	28.23	4.1	29.47
Total Variable Costs		134.09		183.52		203.18		123.36		115.19		120.84

See notes on pages 10 and 11.

* Variable costs per acre for crops participating in the feed grain program (corn and wheat) are shown per base acre. Since the maximum 90 percent (675 acres) of the 750 acre corn base is planted, all costs are reduced to 90 percent of the cost per planted acre. Similarly, the maximum 95 percent (142 acres) of the 150 acre wheat base is planted with costs shown at 95 percent of the cost per planted acre. Set aside acreage includes 75 acres of corn base and 8 acres of wheat base. Corn and wheat yields are per base acre. "Other " growing costs for participating crops include costs for one custom mowing for weed control on set aside acres.

** Costs for non-participating corn and wheat enterprises are taken from Table 6.

Table 9. Field Crop Enterprise Budgets
Comparison of Returns Over Variable Costs
1,200 acre Crop Farm #1 - 1990 Projected
(Government program participation and non-participation compared)

Crop	Hay	Corn grain		Soybeans	Winter wheat	
		Participate	Non-part*	(drilled)	Participate	Non-part*
Acres: planted/set aside	100	675/75	750	200	142/8	150
Yield / acre	3 tn	108 bu	120 bu	35 bu	57 bu	60 bu
Price / unit, $	74.00	2.40	2.40	5.75	3.70	3.70
	$	$	$	$	$	$
Returns per Acre -		per base ac			per base ac	
Crop	222.00	259.20	288.00	201.25	210.90	222.00
Other	0.00	69.98	0.00	0.00	103.07	70.00
Total Returns	222.00	329.18	288.00	201.25	313.97	292.00
Total Variable Costs - per acre	134.09	183.52	203.18	123.36	115.19	120.84
Net Returns over Variable Costs						
- per acre	87.91	145.66	84.82	77.89	198.78	171.16
- per unit	29.30	1.35	0.71	2.23	3.49	2.85
Break-even price per unit of primary crop to cover variable costs	44.70	1.05	1.69	3.52	0.21	0.85
SENSITIVITY TO CROP PRICE OR YIELD CHANGES:						
20% Lower Crop Price or Yield						
Total returns/ acre	177.60	263.34	230.40	161.00	251.18	233.60
Net returns over variable costs						
- per acre	43.51	79.82	27.22	37.64	135.99	112.76
- per unit	14.50	0.74	0.23	1.08	2.39	1.88
20% Higher Crop Price or Yield						
Total returns/ acre	266.40	395.02	345.60	241.50	376.76	350.40
Net returns over variable costs						
- per acre	132.31	211.50	142.42	118.14	261.57	229.56
- per unit	44.10	1.96	1.19	3.38	4.59	3.83

See notes on page 11.

* From Table 7.

Table 10.

Field Crop Enterprise Budgets
Variable Costs per Acre
1,200 acre Crop Farm #2* - 1990 Projected
(No participation in government programs)

Crop	Hay		Corn Grain (no-till)		Soybeans (drilled)		Winter Wheat	
Acres	100		750		200		150	
Yield / acre	3 tn		115 bu		35 bu		60 bu	
	qty	$	qty	$	qty	$	qty	$
Variable Growing Costs -								
Seed		9.73	28K	25.85	60	15.25	120	15.50
Fert-N (lb)	0	0.00	140	30.80	10	2.20	50	11.00
P (lb)	35	7.00	40	8.00	20	4.00	40	8.00
K (lb)	57	6.84	40	4.80	20	2.40	20	2.40
Lime	0.5	12.85	0.75	19.27	0.5	12.85	0.5	12.85
Chemicals		2.66		24.74		30.43		1.11
Power/Eqpt-								
Fuel, oil		2.20		1.80		5.75		5.75
Repair		2.60		3.99		6.26		6.26
Other		2.00		2.00		3.00		1.00
Total Grow		45.88		121.25		82.14		63.87
Variable Harvesting Costs -								
Power/Eqpt-								
Fuel, oil		9.15		4.58		3.02		4.84
Repair		13.66		11.79		10.43		9.86
Drying		0.00		41.63		0.00		0.00
Twine		7.49		0.00		0.00		2.50
Other		3.00		5.00		5.00		3.00
Total Harvest		33.30		63.00		18.45		20.20
Interest - operating		4.55		7.06		3.86		7.25
Total Selected Variable Costs		83.73		191.31		104.45		91.32
Labor (hr)	7.4	50.62	1.9	14.07	2.4	18.20	4.0	28.90
Total Var Costs		134.35		205.38		122.65		120.22

See notes on page 10.

* With No-till corn grain.

Table 11. Field Crop Enterprise Budgets
Comparison of Returns Over Variable Costs
1,200 acre Crop Farm #2* - 1990 Projected
(No participation in government programs)

Crop	Hay	Corn Grain (no-till)	Soybeans (drilled)	Winter Wheat
Acres	100	750	200	150
Yield / acre	3 tn	115 bu	35 bu	60 bu
Price / unit, $	74.00	2.40	5.75	3.70
	$	$	$	$
Returns per Acre -				
Crop	222.00	276.00	201.25	222.00
Other	0.00	0.00	0.00	70.00
Total Returns	222.00	276.00	201.25	292.00
Total Variable Costs - per acre	134.35	205.38	122.65	120.22
Net Returns over Variable Costs				
- per acre	87.65	70.62	78.60	171.78
- per unit	29.22	0.61	2.25	2.86
Break-even price per unit of primary crop to cover variable costs	44.78	1.79	3.50	0.84
SENSITIVITY TO CROP PRICE OR YIELD CHANGES:				
20% Lower Crop Price or Yield				
Total returns/ ac	177.60	220.80	161.00	233.60
Net returns over variable costs				
- per acre	43.25	15.42	38.35	113.38
- per unit	14.42	0.13	1.10	1.89
20% Higher Crop Price or Yield				
Total returns/ ac	266.40	331.20	241.50	350.40
Net returns over variable costs				
- per acre	132.05	125.82	118.85	230.18
- per unit	44.02	1.09	3.40	3.84

* With No-till corn grain.

Table 12.

Field Crop Enterprise Budgets
Variable Costs per Acre
1,200 acre Crop Farm #1 - 1990 Projected
(Government program participation - optimun crop combination)

Crop	Hay		DSCorn/HMCorn Harvesting alternatives		All DSCorn*		RK Beans		Soybeans*		Winter wheat	
Acres: planted/set aside	100		675/75		675/75		200		200		142/8	
Yield / acre	3 tn		108 bu		108 bu		1200 lb		35 bu		57 bu	
	Qty	$	Qty	$	Qty	$	Qty	$	Qty	$	Qty	$
Variable Growing Costs -			per base ac		per base ac						per base ac	
Seed		9.73	23K	20.48	23K	20.48	84	63.00	60	15.25	114	14.73
Fert-N (lb)	0	0.00	126	27.72	126	27.72	25	5.50	10	2.20	48	10.45
P (lb)	35	7.00	36	7.20	36	7.20	62	12.40	20	4.00	38	7.60
K (lb)	57	6.84	36	4.32	36	4.32	43	5.16	20	2.40	19	2.28
Lime (tn)	0.5	12.85	0.45	11.57	0.45	11.57	0.5	12.85	0.5	12.85	0.48	12.21
Chemicals		2.66		20.49		20.49		19.49		30.43		1.05
Power/Eqpt-												
Fuel, oil		2.02		4.93		4.93		5.92		5.37		5.10
Repair		2.57		6.81		6.59		8.08		6.60		5.97
Other		2.00		2.40		2.40		3.00		3.00		1.27
Total Growing Costs		45.67		105.92		105.70		135.40		82.10		60.66
Variable Harvesting Costs -												
Power/Eqpt-												
Fuel, oil		9.16		4.27		4.23		2.96		3.11		4.68
Repair		13.53		10.40		10.39		10.11		10.22		9.26
Drying		0.00		17.01		34.02		0.57		0.00		0.00
Twine		7.49		0.00		0.00		0.00		0.00		2.38
Other		3.00		4.50		4.50		5.00		5.00		2.85
Total Harvesting Costs		33.18		36.18		53.14		18.64		18.33		19.17
Interest - operating		4.53		5.45		6.09		5.90		3.85		6.89
Total Selected Variable Costs		83.38		147.55		164.93		159.94		104.28		86.72
Labor (hr)	7.4	50.74	2.5	18.68	2.5	18.59	2.7	20.46	2.5	19.08	4.1	28.27
Total Variable Costs		134.12		166.23		183.52		180.40		123.36		114.99

See notes on pages 10 and 11.

Note:

Variable costs per acre for crops participating in the feed grain program (corn and wheat) are shown per base acre. Since the maximum 90 percent (675 acres) of the 750 acre corn base is planted, all costs are reduced to 90 percent of the cost per planted acre. Similarly, the maximum 95 percent (142 acres) of the 150 acre wheat base is planted with costs shown at 95 percent of the cost per planted acre. Set aside acreage includes 75 acres of corn base and 8 acres of wheat base. Corn and wheat yields are per base acre.

* Costs for the participating dry shell corn enterprise and the soybean enterprise are taken from Table 8.

Table 13. Field Crop Enterprise Budgets
Comparison of Returns Over Variable Costs
1,200 acre Crop Farm #1 - 1990 Projected
(Government program participation - optimun crop combination)

Crop	Hay	DSCorn/HMCorn	All DSCorn*	RK Beans	Soybeans*	Winter wheat
		Harvesting alternatives		Alternative crops		
Acres planted/set aside	100	675/75	675/75	200	200	142/8
Yield / acre	3 tn	108 bu	108 bu	1,200 lb	35 bu	57 bu
Price / unit, $	74.00	2.53	2.40	0.22	5.75	3.70
	$	$	$	$	$	$
Returns per Acre -		per base ac	per base ac			per base ac
Crop	222.00	273.24	259.20	264.00	201.25	210.90
Other	0.00	69.98	69.98	0.00	0.00	103.07
Total Returns	222.00	343.22	329.18	264.00	201.25	313.97
Total Variable Costs - per acre	134.12	166.23	183.52	180.40	123.36	114.99
Net Returns over Variable Costs						
- per acre	87.88	176.99	145.66	83.60	77.89	198.98
- per unit	29.29	1.64	1.35	0.07	2.23	3.49
Break-even price per unit of primary crop to cover variable costs	44.71	0.89	1.05	0.15	3.52	0.21
SENSITIVITY TO CROP PRICE OR YIELD CHANGES:						
20% Lower Crop Price or Yield						
Total returns/ acre	177.60	274.58	263.34	211.20	161.00	251.18
Net returns over variable costs						
- per acre	43.48	108.35	79.82	30.80	37.64	136.19
- per unit	14.49	1.00	0.74	0.03	1.08	2.39
20% Higher Crop Price or Yield						
Total returns/ acre	266.40	411.86	395.02	316.80	241.50	376.76
Net returns over variable costs						
- per acre	132.28	245.63	211.50	136.40	118.14	261.77
- per unit	44.09	2.27	1.96	0.11	3.38	4.59

See notes on page 11.

* Data from Table 9.

Table 14.

Field Crop Enterprise Budgets
Comparison of Farm Total Costs and Returns
1990 Projected

Item	500 Acre Dairy Farm		1,200 Acre Field Crop Farm			
			#1 Conv Corn		#2 No-till Corn	
	participate	non-part	participate	non-part	participate	non-par
	$	$	$	$	$	$
Total Crop Returns*	155,496	145,950	356,323	322,250	348,223	313,25(
Variable Costs	$	$	$	$	$	$
Growing						
Seed	7,875	8,444	21,590	23,422	23,672	25,73
Fertilizer, lime	16,731	18,143	49,921	54,428	54,256	59,24
Chemicals, other	6,886	7,355	24,666	26,040	25,492	27,514
Eqpt- fuel, repr	4,269	4,624	13,207	14,436	8,435	9,029
Total growing	35,761	38,566	109,384	118,326	111,855	121,523
Total Harvesting**	13,546	14,079	49,676	54,400	52,288	57,300
Interest- operating	2,274	2,402	6,822	7,377	7,015	7,611
Labor	17,724	18,253	27,057	28,460	22,656	23,588
Total Variable Costs**	69,305	73,300	192,939	208,563	193,814	210,022
Fixed Costs						
Equipment ownership	39,032	39,032	59,595	60,725	52,952	52,952
Land	17,500	17,500	42,000	42,000	42,000	42,000
Total Fixed Costs	56,532	56,532	101,595	102,725	94,952	94,952
Total Crop Costs**	125,837	129,832	294,534	311,288	288,766	304,974
Net Returns Over:						
Variable Costs- Farm	86,191	72,650	163,384	113,687	154,409	103,228
Per acre	172	145	136	95	129	86
Total Costs - (return to management & profit)						
Farm	29,659	16,118	61,789	10,962	59,457	8,276
Per acre	59	32	51	9	50	7

* Value at harvest time at the farm. Returns include straw & government program receipts.
Crop acres: Dairy Farm - Hay (100), HCS (150), Corn silage (150), HMEC (100). With gov't program participation, 25 acres of HMEC are set aside.
Crop Farms - Hay (100), Corn grain (750), Soybeans (200), Wheat (150). With gov't program participation, 75 acres of corn and 8 acres of wheat are set aside.

** Includes drying; excludes hauling, storage, marketing, and management.

Table 15. Field Crop Enterprise Budgets
Comparison of Farm Total Costs and Returns
1,200 Acre Crop Farm #1 - 1990 Projected
(no participation in government programs)

Item	Crops (acres) - Hay (100), Corn grain (750), W. Wheat (150) plus 200 acres of: Soybeans	or RK Beans	or Oats
	$	$	$
Total Crop Returns*	322,250	334,800	318,000
Variable Costs	$	$	$
Growing			
Seed	23,422	32,972	23,407
Fertilizer, lime	54,428	57,320	56,588
Chemicals, other	26,040	23,852	19,977
Eqpt- fuel, repr	14,436	14,891	14,477
Total growing	118,326	129,035	114,449
Total Harvesting**	54,400	54,520	54,727
Interest- operating	7,377	7,790	7,246
Labor	28,460	28,569	29,911
Total Variable Costs**	208,563	219,914	206,333
Fixed Costs			
Equipment ownership	60,725	60,725	57,926
Land	42,000	42,000	42,000
Total Fixed Costs	102,725	102,725	99,926
Total Crop Costs**	311,288	322,639	306,259
Net Returns Over: Variable Costs- Farm	113,687	114,886	111,667
Per acre	95	96	93
Total Costs - (return to management & profit) Farm	10,962	12,161	11,741
Per acre	9	10	10

* Value at harvest time at the farm. Returns include straw.

** Includes drying; excludes hauling, storage, marketing, & management.

Table 16. Field Crop Enterprise Budgets
Comparison of Farm Total Costs and Returns
Various Marketing and Crop Mix Combinations
1,200 Acre Crop Farm #1 - 1990 Projected

Item	Full Participation in Gov't Programs		
	Base farm with corn sold as: DSC only	Base farm with corn sold as: DSC & HMC	Base farm w/DSC & HMC & RK Beans
	$	$	$
Total Crop Returns*	356,323	366,448	379,403
Variable Costs	$	$	$
Growing			
Seed	21,590	21,590	31,140
Fertilizer, lime	49,921	49,921	52,813
Chemicals, other	24,666	24,666	22,478
Eqpt- fuel, repr	13,207	13,207	13,722
Total growing	109,384	109,384	120,153
Total Harvesting**	49,676	36,919	37,048
Interest- operating	6,822	6,333	6,749
Labor	27,057	27,057	27,405
Total Variable Costs**	192,939	179,693	191,355
Fixed Costs			
Equipment ownership	59,595	59,595	60,183
Land	42,000	42,000	42,000
Total Fixed Costs	101,595	101,595	102,183
Total Crop Costs**	294,534	281,288	293,538
Net Returns Over:			
Variable Costs- Farm	163,384	186,755	188,048
Per acre	136	156	157
Total Costs - (return to management & profit)			
Farm	61,789	85,160	85,865
Per acre	51	71	72

* Value at harvest time at the farm. Returns include straw.

** Includes drying; excludes hauling, storage, marketing, & management.

Grower Worksheets

The following worksheets are intended to assist the crop producer in making decisions with regard to his or her combination of enterprises for the coming year. Table 17, the Budget Worksheet, closely follows the format of the budgets developed in Table 2 through Table 13. Completion of the Budget Worksheet for a crop enterprise will enable the grower to compare his or her estimate with the budgets in this publication for variable costs and returns per acre for a given crop.

Following the Budget Worksheet is a series of three worksheets designed to guide the user through a cash flow projection for a proposed crop mix for the whole farm. The format is somewhat different from that used in the budgets. Of necessity, the budgets present reasonable estimates of typical costs per acre for each crop suggested. They are based on stated input prices and levels and machinery complement assumptions. On the other hand, the worksheets enable a grower to enter specific figures based on his or her experience and estimates. Thus, the result should be a more accurate estimate of an individual grower's experience.

Worksheet 1 provides a place to list expected returns and variable costs per acre for each proposed crop. The purpose is to estimate the returns per acre over cash variable costs. One major problem may be in estimating fuel and repair costs for power (tractors and trucks) and equipment used to grow and harvest the crops. Table 18 summarizes these costs for crops used in the budgets. These fuel and repair costs would be reasonable to use in Worksheet 1 in the absence of more accurate farm data.

Worksheet 2 provides a place to list the various cash fixed costs for the whole farm business for the previous year. Once summarized, last year's costs can be adjusted to reflect changes that can be anticipated for this year. For continued farm operation, these cash costs must be met regardless of crop mix decisions.

Finally, Worksheet 3 provides a place to summarize returns over cash variable costs for two different proposed crop mixes. It leads to an estimate of cash available or needed after allowing for variable costs for each crop mix, total farm cash fixed costs including the operator's living costs, and scheduled debt service. Excess cash would be available for operating loan interest, capital purchases or savings, etc. Operating loan principal is covered by the cash variable costs included. A lack of excess cash would indicate a need for additional operating cash from increased borrowing, savings, off-farm income or other nonfarm sources during the year. This is a cash flow projection for the year; it is not a measure of enterprise or farm profit since important costs such as depreciation and equity interest have not been considered.

Table 17. Crop _____ Year _____

BUDGET WORKSHEET. Field Crop Enterprise
Variable Costs and Returns per Acre

Item	Quantity	Units	Per Unit	Average Per Acre	
	number		$	$	
Returns					
Crop _____	_____	_____	_____	_____	
Other _____	_____	_____	_____	_____	
Total Crop Returns					(1)$_____
Variable Costs					
Growing					
Seed _____	_____	_____	_____	_____	
Fert. _____	_____	_____	_____	_____	
_____	_____	_____	_____	_____	
_____	_____	_____	_____	_____	
Lime	_____	_____	_____	_____	
Chem. _____	_____	_____	_____	_____	
_____	_____	_____	_____	_____	
_____	_____	_____	_____	_____	
_____	_____	_____	_____	_____	
Power/Equipment[a] - Fuel, oil				_____	
Repair, maint.				_____	
Other				_____	
Total Growing Costs					$_____
Harvesting					
Power/Equipment[a] - Fuel, oil				_____	
Repair, maint.				_____	
Drying				_____	
Twine, supplies				_____	
Other				_____	
Total Harvesting Costs					_____
Interest - operating					_____
Total Selected Variable Costs					$_____
Labor _____	_____	hours	_____	_____	
_____	_____	hours	_____	_____	
Total Labor Costs					_____
Total Variable Costs					(2)$_____
Net Returns over Variable Costs					(1-2)$_____

[a]See Table 18 for suggested costs if farm data are not available.

Table 18. Budgeted Fuel and Repair Costs for Machinery Needed to Grow and Harvest Selected Crops, 1990

Crop	From Table:	Cash Variable Costs per Acre	
		Fuel, Lubrication	Repairs, Maintenance
		$	$
Hay	2	10.93	15.41
Hay crop silage	2	15.28	22.21
Corn silage	2	15.61	16.82
High moisture ear corn	2	13.64	14.68
Corn grain - conv. till	6	10.05	19.30
Corn grain - no-till	10	6.38	15.78
Oats	4	10.32	17.12
Wheat	4	10.19	16.57
Soybeans	4	8.37	17.15
Red Kidney Beans	4	8.65	18.42

Note - Use data in Tables 2, 6, and 10 as a guide for allocating these costs between growing and harvesting, if desired.

Worksheet 1. CALCULATION OF RETURNS OVER CROP CASH VARIABLE COSTS

Crop Mix. No. _____ (Use crops that are . . .

Crop			
Yield per acre expected			
Price per unit expected when sold		$	$
Crop returns per acre		$	$
Other returns per acre			
Total returns per acre	(1)	$	$
Cash Variable Costs[a]		-------- per acre --------	
Labor - part-time seasonal		$	$
Seed			
Fertilizer:			
Lime			
Chemicals:	Herbicides		
	Insecticides		
	Fungicides		
	Seed Treatment		
Supplies - twine, preservative, etc.			
Power & equipment to grow & harvest:[b]			
- Fuel & lube			
- Repair & maintenance			
Machine hire, rent			
Drying			
Hauling			
Marketing			
Storage			
Other cash costs			
Total Crop Cash Variable Costs	(2)	$	$
Returns Over Cash Variable Costs	(1-2)	$	$

[a]Costs experienced only if the crop is produced.

[b]See Table 18 for suggested costs if farm data is not available.

Worksheet 1. (continued)

. . . feasible for your operation - include set-aside acres as a "crop".)

$	$	$	$	$	$
$	$	$	$	$	$
$	$	$	$	$	$

---------- per acre ----------

$	$	$	$	$	$
$	$	$	$	$	$
$	$	$	$	$	$

Worksheet 2. CALCULATION OF ANNUAL FARM CASH FIXED COSTS[a]

Total crop acres:	Total for Last Year	Total for This Year	Portion for all Crops
Owned			
Rented			
Total Operated			
Annual Cash Fixed Costs	---------- total cost per farm ----------		
Operator(s) draw (wage, living expenses, etc.)	$	$	$
Regular hired labor -			
Gross wages			
Employer costs (Social Security, Workerman's Comp., unemployment)			
Benefits (Housing, insurance, etc.)			
Taxes - real estate			
Rent - cropland, buildings			
Insurance - fire, liability			
Vehicle taxes & insurance			
Utilities - phone, electric, water, etc.			
Miscellaneous costs			
Total Farm Cash Fixed Costs	$	$	$

[a]Note: These annual farm cash fixed costs must be met for continued operation of the business this year. This year's costs are based on last year's costs adjusted to reflect anticipated changes in costs, price levels and, perhaps, crop mixes and acreages. Consideration of these factors is necessary to make reasonable estimates of the cash fixed costs for the farm business for "This Year". For a farm with livestock, fixed costs related to crop production only should be entered in the third column.

Worksheet 3. CASH RESULTS OF CROP MIX ALTERNATIVES

Year 19___

Crop (From Worksheet 1)	Crop Mix 1 Acres (1)	Returns Over Cash Variable Costs Per Acre (2)	Returns Over Cash Variable Costs Total (1x2)	Crop Mix 2 Acres (1)	Returns Over Cash Variable Costs Per Acre (2)	Returns Over Cash Variable Costs Total (1x2)
_____	_____	$_____	$_____	_____	$_____	$_____
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
Total Farm Return Over Cash Variable Costs			$_____			$_____
less Total Farm Cash Fixed Costs (from Worksheet 2, crop portion)			-_____			-_____
less Scheduled Debt Service Excluding Crop Loans[a] for the Current Year			-_____			-_____
Cash - available for crop loan interest, purchases, savings, etc.			$_____			$_____
or - (needed) from increased debt or nonfarm sources			($_____)			($_____)

[a]Crop or operating loan principal is covered by cash variable costs included on Worksheet 1.

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Lazarus, W.F., Crop Decision Analysis with Machine Calculations, A.E. Ext. 86-39, December 1986, Department of Agricultural Economics, Cornell University, Ithaca, New York.

Snyder, D.P., 1990 Budget Guide; Estimated Prices for Crop Operating Inputs and Capital Investment Items, A.E. Res. 90-3, March 1990, Department of Agricultural Economics, Cornell University, Ithaca, New York.

Appendix Table 1. Crop Machinery Investment
500 Acre Dairy Farm[a]
1990 Projected

Item		1990 List Price	Purchase Price[b]	Annual Ownership Cost[c]
		$	$	$
Tractors - 120 hp w/cab & air		49,862	37,960	6,093
80 hp		29,785	22,676	3,639
60 hp		23,685	18,032	2,894
Trucks - pick-up, 2WD		14,500	11,039	2,337
Large farm	(2 used)	16,000	12,180	2,250
Plow	(5-18")	9,931	7,561	1,278
Disc	(14')	6,672	5,079	858
Drag	(16')	3,568	2,716	459
Seeder w/cultipacker	(10')	5,317	4,048	684
Corn planter, conv.	(6R)	13,261	10,096	1,706
Sprayer	(28')	4,583	3,489	590
Cultivator	(6R)	3,783	2,880	487
Fertilizer spreader	(20')	3,354	2,553	432
Mower-conditioner	(12')	16,614	13,526	2,860
Rake, side	(9')	3,622	2,757	466
Baler w/kicker		14,571	11,093	1,875
Bale wagons	(2)	4,864	3,703	594
Forage harvester, pto base unit, 3 row		19,525	15,896	3,361
- Grass head	(7.5')	3,913	3,186	674
- Corn head	(3R)	9,437	7,683	1,624
- Snapper head	(2R)	7,900	6,432	1,360
Dump wagon	(14')	11,154	9,081	2,019
Grain wagons	(2)	4,040	3,076	494
Totals		279,941	216,742	39,034
Per Acre		560	433	78

[a]Dairy farm with 100 acres of hay, 150 acres of hay crop silage, 150 acres of corn silage, and 100 acres of high moisture ear corn. Complement does not include power or equipment needed for livestock.

[b]Purchase price is based on the 1990 list price times an index value to reflect an average price paid over the average ownership period for each machine.

[c]Ownership cost is based on these assumptions:

Owned for:
- 6 years - Forage harvester and heads, dump wagon, and mower.
- 10 years - All other equipment, tractors, and trucks.

Trade-in values:
- 40 percent - Tractors and wagons.
- 30 percent - Mower, forage harvester, and heads.
- 10 percent - Trucks.
- 20 percent - All other equipment.

Straightline depreciation, 11.5 percent interest on average investment; two percent of purchase price for insurance and storage except actual truck insurance.

Appendix Table 2. Crop Machinery Investment 1,200 Acre Crop Farm #1[a] 1990 Projected

Item		1990 List Price	Purchase Price[b]	Annual Ownership Cost[c]
		$	$	$
Tractors - 120 hp		49,862	38,669	6,206
80 hp FWA		35,301	27,377	4,394
80 hp		29,785	23,099	3,707
60 hp		23,685	18,368	2,948
40 hp		17,546	13,607	2,184
Trucks - Pick-up, 4WD		16,500	12,562	2,593
Large farm	(2 used)	16,000	12,180	2,250
Combine - Power unit, SP, diesel, 2WD		74,938	65,205	15,307
Corn head	(4R)	12,672	10,442	2,451
Grain head	(13')	7,729	6,369	1,314
Bean head	(4R)	9,607	7,917	1,633
Plow	(5-18") (2)	19,862	15,122	2,556
Disc	(14') (2)	13,344	10,158	1,716
Drag	(16') (2)	7,136	5,432	918
Cultipacker	(14')	2,981	2,269	374
Drill-seeder	(21x7")	7,768	5,914	999
Corn planter, conv.	(8R)	18,575	14,141	2,330
Sprayer	(28')	4,583	3,489	590
Cultivator	(8R)	5,428	4,132	681
Fertilizer spreader	(20')	3,354	2,553	442
Mower-conditioner	(9')	11,393	8,674	1,429
Rake, side	(9')	3,622	2,757	443
Baler w/kicker		14,571	11,093	1,875
Bale wagons	(3)	7,296	5,555	892
Grain wagons	(2)	4,040	3,076	494
Totals		417,578	330,160	60,726
Per Acre		348	275	51

[a]For a 1,200 acre cash crop farm with 100 acres of hay, 750 acres of corn grain, 200 acres of soybeans, and 150 acres of winter wheat.

[b]Purchase price is based on the 1990 list price times an index value to reflect an average price paid over the average ownership period for each machine.

[c]Ownership cost is based on these assumptions:

Owned for:

5 years - Combine and heads.

10 years - All other equipment, tractors, and trucks.

Trade-in values:

50 percent - Grain and bean heads.

40 percent - Tractors, wagons, and rake.

30 percent - Combine and corn head, planter, cultipacker, cultivator, and mower.

10 percent - Trucks.

20 percent - All other equipment.

Straightline depreciation, 11.5 percent interest on average investment; two percent of purchase price for insurance and storage except actual truck insurance.

Appendix Table 3. Crop Machinery Investment 1,200 Acre Crop Farm #2[a] 1990 Projected

Item		1990 List Price	Purchase Price[b]	Annual Ownership Cost[c]
		$	$	$
Tractors - 120 hp		49,862	37,960	6,093
80 hp FWA		35,301	26,875	4,313
60 hp		23,685	18,032	2,894
40 hp		17,546	13,358	2,144
Trucks - Pick-up, 4WD		16,500	12,562	2,593
Large farm	(2 used)	16,000	12,180	2,250
Combine - Power unit, SP, diesel, 2WD		74,938	61,752	14,496
Corn head	(4R)	12,672	10,442	2,451
Grain head	(13')	7,729	6,369	1,314
Bean head	(4R)	9,607	7,917	1,633
Plow	(5-18")	9,931	7,561	1,278
Disc	(14')	6,672	5,079	858
Drag	(16')	3,568	2,716	459
Cultipacker	(14')	2,981	2,269	374
Drill-seeder	(21x7")	7,768	5,914	999
Corn planter, no-till	(8R)	21,036	16,015	2,638
Sprayer	(28')	4,583	3,489	590
Fertilizer spreader	(20')	3,354	2,553	442
Mower-conditioner	(9')	11,393	8,674	1,429
Rake, side	(9')	3,622	2,757	443
Baler w/kicker		14,571	11,093	1,875
Bale wagons	(3)	7,296	5,555	892
Grain wagons	(2)	4,040	3,076	494
Totals		364,655	284,198	52,952
Per Acre		304	237	44

[a]For a 1,200 acre cash crop farm with 100 acres of hay, 750 acres of no-till corn grain, 200 acres of soybeans, and 150 acres of winter wheat.

[b]Purchase price is based on the 1990 list price times an index value to reflect an average price paid over the average ownership period for each machine.

[c]Ownership cost is based on these assumptions:

Owned for:
- 5 years - Combine and heads.
- 10 years - All other equipment, tractors, and trucks.

Trade-in values:
- 50 percent - Grain and bean heads.
- 40 percent - Tractors, wagons, and rake.
- 30 percent - Combine and corn head, planter, cultipacker, and mower.
- 20 percent - All other equipment.

Straightline depreciation, 11.5 percent interest on average investment; two percent of purchase price for insurance and storage except actual truck insurance.

Appendix Table 4. Machinery Operating Factors Field Crop Enterprise Budgets 1990

Machine		Width	Speed	Field Efficiency	Tractor Size
		feet	mph	percent	hp
Plow	(5-18")	7.5	4.0	80	120, 80 FWA
Disc	(14')	14.0	4.5	80	120, 80 FWA
Drag	(16')	16.0	5.5	80	80 FWA, 80
Cultipacker	(14')	14.0	6.0	80	40
Drill-seeder		12.2	5.0	75	60
Corn planter, conv.	(6R)	15.0	5.0	65	60
Corn planter, conv.	(8R)	20.0	4.5	70	80
Corn planter, NT	(8R)	20.0	5.0	70	80 FWA
Sprayer	(28')	28.0	4.0	65	60
Fertilizer spreader		20.0	4.0	70	60
Cultivator	(6R)	15.0	4.5	80	80
Cultivator	(8R)	20.0	4.5	80	80
Mower-conditioner	(9')	9.0	5.0	70	60
Mower-conditioner	(12')	12.0	4.5	70	80
Rake, side		9.0	4.5	80	40
Rake, side		12.0	4.5	80	60
Baler w/kicker		9.0	3.0	70	80
Baler w/kicker		12.0	2.5	70	80

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